

## **REMARKS**

Entry of the foregoing and reconsideration of the application identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.111 and in light of the remarks which follow, are respectfully requested.

By the above amendments, the specification has been amended to correct a typographical error. Claim 2 has been amended for clarification to recite that the method comprises contacting the silicon ingot with the slurry and cutting the silicon ingot. Support for this amendment can be found in the instant specification at least at pages 17-20, taken in connection with Figure 4(b). Claim 2 has also been amended for readability purposes. Support for new dependent claims 3 and 6 can be found in the specification at least at page 8, lines 10-12. Support for new dependent claims 4 and 7 can be found in the specification at least at page 10, lines 14-16. Support for new dependent claims 5 and 8 can be found in the specification at least at page 13, lines 8-11. Support for new dependent claim 9 can be found in the specification at least at page 17, lines 6-9. Support for new dependent claims 10 and 11 can be found in the specification at least at page 13, lines 4-20.

In the Official Action, claim 2 stands rejected under 35 U.S.C. §112, second paragraph, for the reasons set forth at page 2 of the Official Action. As discussed above, claim 2 has been amended to recite that the method comprises contacting the silicon ingot with the slurry and cutting the silicon ingot. Accordingly, withdrawal of the §112 rejection is respectfully requested.

Claim 1 stands rejected under 35 U.S.C. §102(a) or (e) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as being obvious over U.S. Patent Application Publication No. 2005/0072524 (*Mueller et al.*). Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claim 1 is directed to a slurry for cutting a silicon ingot, comprising abrasive grains and a basic material, wherein: the basic material is alkaline metal hydroxide, alkaline earth hydroxide or mixtures thereof; a content of the basic material is at least 3.5% by mass based on a total mass of a liquid component of the slurry; the slurry contains organic amine in a mass ratio of 0.5 to 5.0 with respect to water in the liquid component of the slurry; and pH of the slurry is 12 or more.

*Mueller et al* relates to a system for planarizing or polishing a composite substrate comprising (i) a polishing composition comprising (a) about 0.5 wt. % or more of fluoride ions, (b) about 1 wt. % or more of an amine, (c) about 0.1 wt. % or more of a base, and (d) water, and (ii) an abrasive (paragraph 0006).

*Mueller et al* does not disclose or suggest each feature recited in claim 1. For example, *Mueller et al* does not disclose or suggest that the slurry contains organic amine in a mass ratio of 0.5 to 5.0 with respect to water in the liquid component of the slurry, as recited in claim 1. By comparison, *Mueller et al* discloses that generally, the amine is present in the polishing system in an amount that does not exceed about 25 wt. %, preferably an amount that does not exceed about 20 wt. % (paragraph 0017). However, *Mueller et al* provides no specific guidance for selecting the amount of the amine with respect to the water content of the polishing system.

In this regard, *Mueller et al* discloses various exemplary polishing systems at pages 4 and 5 thereof. Example 1 disclosed by *Mueller et al* employed about 7 wt. % 2-dimethylamino-2-methyl-1-propanol 80 (hereinafter "DMAMP-80") and about 74 wt. % water, and Example 2 of *Mueller et al* employed about 6 wt. % DMAMP-80 and about 80.75 wt. % water. It appears that the weight ratio of DMAMP-80 to water in both of Examples 1 and 2 was less than 0.1, and that each of compositions A to E discussed in Example 3 also

employed a weight ratio of DMAMP-80 to water of less than 0.1. Clearly, *Mueller et al* fails to disclose or suggest in the examples thereof a slurry containing organic amine in a mass ratio of 0.5 to 5.0 with respect to water in the liquid component of the slurry, as recited in claim 1.

As discussed in the specification, employing a slurry for cutting a silicon ingot having the claimed organic amine/water mass ratio can enable the reduction of the cutting resistance during the cutting process of a silicon ingot to obtain a wafer of high quality (page 5, lines 9-14). By comparison, *Mueller et al* has no mention or suggestion of employing the polishing system thereof in a process for cutting a silicon ingot. Moreover, *Mueller et al* fails to provide any recognition or suggestion of the significance of the mass ratio of the organic amine to water, let alone a mass ratio of 0.5 to 5.0 as recited in claim 1.

In view of the above, it is apparent that *Mueller et al* does not anticipate or render obvious claim 1. Accordingly, for at least the above reasons, withdrawal of the above rejection is respectfully requested.

Claim 2 stands rejected under 35 U.S.C. §103(a) as being obvious over Japanese Patent Document No. 02-262955 (*JP '955*) in view of *Mueller et al* and U.S. Patent No. 4,468,339 (*Rysek et al*). Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claim 2 is directed to a method of cutting a silicon ingot using a slurry for cutting a silicon ingot, the method comprising contacting the silicon ingot with the slurry and cutting the silicon ingot, wherein the slurry comprises abrasive grains and a basic material, and wherein: the basic material is alkaline metal hydroxide, alkaline earth hydroxide or mixtures thereof; a content of the basic material is at least 3.5% by mass based on a total mass of a liquid component of the slurry; the slurry contains organic amine in a mass ratio of 0.5 to 5.0

with respect to water in the liquid component of the slurry; pH of the slurry is 12 or more; and the slurry is used at 65°C to 95°C.

*JP '955* does not disclose or suggest each feature recited in claim 2. In this regard, the Patent Office has relied on *JP '955* for disclosing "a method for cutting a silicon ingot which employs a cutting slurry" (Official Action at page 3). However, as acknowledged at pages 3 and 4 of the Official Action, *JP '955* does not appear to disclose or suggest a slurry for cutting a silicon ingot, wherein the slurry contains organic amine in a mass ratio of 0.5 to 5.0 with respect to water in the liquid component of the slurry, as recited in claim 2.

*Mueller et al* fails to cure the above-described deficiencies of *JP '955*. For example, like *JP '955*, *Mueller et al* does not disclose or suggest a slurry containing organic amine in a mass ratio of 0.5 to 5.0 with respect to water in the liquid component of the slurry, as recited in claim 2. This deficiency is discussed above in greater detail with respect to the §102/§103 rejection based on *Mueller et al*.

*Rysek et al* fails to cure the above-described deficiencies of *JP '955* and *Mueller et al*. In this regard, the Patent Office has relied on *Rysek et al* for suggesting that "slurries based on abrasive are known to be used for either cutting or polishing" (Official Action at page 3). However, like the other applied art, *Rysek et al* does not disclose or suggest a slurry containing organic amine in a mass ratio of 0.5 to 5.0 with respect to water in the liquid component of the slurry, as recited in claim 2.

Moreover, it is well established that in order for the Patent Office to properly maintain an obviousness rejection based on an alleged suggestion or motivation to modify references, the prior art must suggest the desirability of the claimed invention. See M.P.E.P. §2143.01. In the present case, the Patent Office has relied on *Rysek et al* for suggesting that "slurries based on abrasives are known to be used for either cutting or polishing." However, one of

ordinary skill in the art would not have concluded from the *Rysek et al* disclosure that all abrasive-based slurries can be used interchangeably in cutting and polishing applications. Rather, the disclosure of *Rysek et al* relied on by the Patent Office relates to the particular slurry disclosed therein, and not to all other abrasive-based slurries, as suggested by the Patent Office.

Moreover, even if abrasive-based slurries were known to be used for either cutting or polishing applications, this fact alone would not have motivated one of ordinary skill in the art to replace the composition of *JP '955* with the composition of *Mueller et al*. In this regard, *JP '955* discloses that the use of the composition thereof provides "superior" results, "making it possible to cut even 10-inch ingots restricting the warpage to 15 microns or less." By contrast, *Mueller et al* relates to a polishing composition, and has no mention or suggestion that its composition is suitable for use in an ingot-cutting process, let alone that use thereof would result in some advantage or benefit to the ingot-cutting process. Simply put, absent an improper resort to Applicants' own disclosure, one of ordinary skill in the art would not have been motivated to modify the ingot-cutting process of *JP '955* by employing the polishing composition of *Mueller et al* therein.

For at least the above reasons, it is apparent that no *prima facie* case of obviousness exists. Accordingly, withdrawal of the §103(a) rejection is respectfully requested.

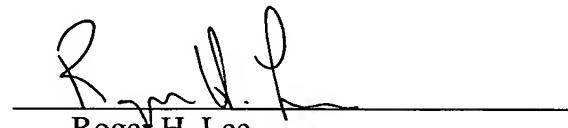
From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order, and such action is earnestly solicited.

If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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FROM BURNS, DOANE, SWECKER & MATHIS)

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